



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Particulate Matter (PM_{2.5}/PM₁₀)
Office of Air Quality

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Description:

- Particulate matter is commonly referred to as “PM” or particle pollution. PM is a complex mixture of particles, including dust, dirt, soot, smoke, and liquid droplets that are found in the air in sizes small enough to be inhaled.
- Coarse particles that are larger than 2.5 micrometers and smaller than 10 micrometers in diameter are referred to as PM₁₀. Fine particles that are 2.5 micrometers or smaller in diameter are referred to as PM_{2.5}. For comparison, the diameter of a human hair is approximately 70 micrometers.
- PM comes from residential combustion activities such as furnaces, air conditioners, wood fireplaces, and outdoor hydronic heaters. PM is also created from industrial combustion activities such as large boilers, process heaters and incinerators, and vehicle exhaust. The composition of particles varies widely. Some particles are emitted directly into the air from cars, trucks, buses, homes, factories, construction sites, unpaved roads, stone crushing, and wood burning. Other particles are formed in the air as sunlight and water vapor chemically react with gases emitted from fuel combustion.

National Ambient Air Quality Standards (NAAQS) for Particulate Matter:

- The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to set National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants that are considered harmful to public health and the environment. The six criteria pollutants are: particulate matter, carbon monoxide, ground-level ozone, nitrogen dioxide, sulfur dioxide, and lead.
- The NAAQS set limits for the criteria pollutants in the ambient air. Limits established to protect human health are referred to as “primary standards”; limits established to prevent environmental damage are referred to as “secondary standards”.
- The CAA requires periodic review of the science upon which the NAAQS are based, as well as the standards themselves. Primary and secondary NAAQS were first established for particulate matter in 1971. The most recent revision to the standards was in December 2012 when U.S. EPA lowered the primary annual standard for PM_{2.5}.
- The primary NAAQS for PM_{2.5}, measured as an annual mean, is set at 12 micrograms per cubic meter of air. To attain this standard, the 3-year average of annual mean concentrations cannot exceed 12 micrograms per cubic meter.
- A secondary NAAQS for PM_{2.5} (used for visibility analyses), also measured as an annual mean, is set at 15 micrograms per cubic meter of air. To attain this standard, the 3-year average of annual mean concentrations cannot exceed 15 micrograms per cubic meter.
- The primary and secondary NAAQS for PM_{2.5} measured over a 24-hour period is set at 35 micrograms per cubic meter of air. To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations cannot exceed 35 micrograms per cubic meter.
- The primary and secondary NAAQS for PM₁₀ measured over a 24-hour period is set at 150 micrograms per cubic meter of air. This standard cannot be exceeded more than once per year on average over three years.

Environmental Impacts:

- PM affects both human health and the environment and elevated levels can occur year-round.
- PM can be carried long distances by the wind and can stain and damage stone and other materials, causing aesthetic damage to landmarks and municipal property.
- PM_{2.5} is so small that the particles can be inhaled deep into the lungs and cause health problems in sensitive groups such as the very young, the elderly, and those with heart or lung disease.
- PM_{2.5} is a major cause of reduced visibility and haze in parts of the U.S.
- Breathing particulate matter has been linked to a series of significant health problems including:
 - Aggravated asthma.



A State that Works

- Increased respiratory symptoms, such as wheezing, coughing, and difficult or painful breathing.
- Chronic bronchitis.
- Decreased lung function.
- Premature death.

IDEM's Role:

- The Indiana Department of Environmental Management (IDEM) is responsible for protecting human health and the environment while providing for safe industrial, agricultural, commercial, and governmental operations vital to a prosperous economy.
- IDEM is responsible for protecting air quality in Indiana through the implementation of federal, regional, and state control measures, regulations, and ambient air monitoring.
- IDEM works to protect and improve air quality by monitoring air quality, issuing advisories for the public when air quality may be unhealthy, and educating citizens and businesses about their roles in improving air quality.
- Through air quality monitoring and forecasting, certain days are designated Air Quality Action Days for particulate matter to inform sensitive groups to avoid physical exertion, limit outdoor activities, and stay indoors when possible. Air Quality Action Days for particulate matter can occur anytime of the year.
- Indiana operates an extensive monitoring network to gather data on levels of criteria air pollutants in the ambient air. The data is used to determine if Indiana's air meets the NAAQS. Areas within Indiana which meet air quality standards are classified as "attainment" or, if they exceed the air quality standards they are classified as "nonattainment".
- For areas not achieving (attaining) air quality standards, IDEM will work to help communities implement programs to achieve the standards as quickly as possible.
- Data from Indiana's air monitoring network is also used to identify trends in Indiana's air quality and to provide information for U.S. EPA's AIRNow website and the National Air Quality Index (AQI), a daily air quality report.

Citizen's Role:

There are a number of actions every citizen can take to reduce their contribution or exposure to particulate matter:

- Avoid using leaf blowers and other dust-producing equipment.
- Drive slowly on unpaved roads and other dirt surfaces.
- Compost leaves, twigs, and other yard waste instead of burning them.
- Avoid unnecessary burning of trash, vegetation, wood, and charcoal.
- Keep automobiles properly maintained, including tire pressure.
- Carpool, walk, bike, or use public transportation when possible.
- Reduce home energy consumption by turning off lights, televisions, and other appliances, when not in use, to reduce emissions from energy production.

Additional Information:

- For more information on particulate matter, please visit these IDEM websites:
 - www.IN.gov/idem/airquality/2343.htm for PM_{2.5}-specific information and information for other criteria pollutants for Indiana.
 - www.IN.gov/idem/airquality/2489.htm for air quality monitoring data for PM and other pollutants.
 - www.IN.gov/idem/airquality/2383.htm for a map of PM_{2.5} monitors and for the most recent PM_{2.5} emission readings.
 - www.IN.gov/idem/airquality/2382.htm for a list of PM₁₀ monitors and their locations.
 - www.IN.gov/idem/airquality/2424.htm for the nonattainment status for Indiana counties or townships.
- For daily regional forecasts of air quality for Indiana, visit IDEM's SmogWatch website at www.smogwatch.IN.gov or call the SmogWatch line at (800) 631-2871 or (317) 233-2318.
- For further information on the NAAQS, visit U.S. EPA's website at <http://epa.gov/air/criteria.html>.
- For questions and concerns, feel free to call IDEM's Office of Air Quality at (317) 233-0178 or (800) 451-6027, ext. 3-0178.